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ORIGINAL ARTICLE

LigaSure hemorrhoidectomy vs Milligan morgan hemorrhoidectomy: A Quasi-Experimental Study.

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ABSTRACT… Objective: To explore the efficacy of two surgical procedures by comparing the mean operative time, average blood loss and postoperative pain score during conventional and LigaSure. **Study Design:** Quasi-experimental study. **Setting:** Department of Surgery, Aziz Fatimah Hospital. **Period:** 1st July 2020 -30th June 2021. **Material & Methods:** Sixty patients with grade three and four haemorrhoids were randomized into two groups with 30 patients each. A questionnaire comprising all the variables was filled out and analyzed in SPSS 21. **Results:** Thirty patients were randomized into two groups, with group A comprising 21 (70%) females and, 9 (30%) males and 24 (80%) females, 6(20%) males in group B undergoing conventional hemorrhoidectomy. The study was single-blind, as the patients were unaware of the procedure they underwent. The mean age in group A was 39 years, and in group, B was 43 years. The mean operative time calculated was 38.4±2.77 and 51.7±2.60 in LigaSure and Milligan Morgan Hemorrhoidectomy, respectively, with a P-value calculated <0.00001. The average blood loss in LigaSure was 31.3 ± 5.76 and 49 ± 7.11 in Milligan morgan hemorrhoidectomy. Moreover, the pain assessment score on day one and all other variables were statistically significant, with a P-value of <0.00001. **Conclusion:** Ligasure hemorrhoidectomy is a safer surgical procedure associated with less operative time, blood loss and postoperative pain with shorter hospital stay and rapid wound healing.

Key words: Hemorrhoidectomy, Ligasure, Milligan Morgan Hemorrhoidectomy.

INTRODUCTION

Haemorrhoids are dilated anal cushions that may prolapse from the anal canal. The prevalence of haemorrhoids seen in the population exceeds 5%, particularly in patients above the age of 40 years. Haemorrhoids are classified into different classes depending on the extent of the disease. Clinical pieces of evidence report successful treatment of first and second-degree haemorrhoids. However, third and fourth-degree haemorrhoids need surgical intervention. Literature reports two gold standard methods for the surgical intervention of haemorrhoids. An open method is named (Milligan-Morgan hemorrhoidectomy) and a closed method (Ferguson hemorrhoidectomy).[1] These traditional open and closed procedures are associated with perioperative and postoperative complications like bleeding, pain, fecal incontinence, and wound infections leading to prolonged wound healing. In recent years, advances in surgical instruments like circular staplers, electrothermal devices, and ultrasonic scalpels have been used and proven more efficacious than the traditional method. One of the latest interventions is the implication of LigaSure in treating haemorrhoids. LigaSure is a hemostatic tool which seals the blood vessel using optimized pressure and radiofrequency signal. It conducts electro diathermy energy through its jaws with very little lateral spread of current or heat. Recently, several studies have been conducted to compare the outcomes of both surgical procedures compared to the traditional method with the LigaSure method.[2] According to studies, Ligasure hemorrhoidectomy does not require any particular expertise in other surgical interventions involving hemorrhoidectomy, such as stapled hemorrhoidectomy. The reason being the procedure performed with Ligasure is very

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much similar to the conventional method.[3] A study conducted in the Indian region advocates the efficacy and effectiveness of Ligasure hemorrhoidectomy with reduced blood loss, postoperative pain, and complications compared to a traditional hemorrhoidectomy. Moreover, LigaSure seals a vessel with a diameter of up to 7mm, and the mean operative time is reduced to a great extent. One added advantage in the implication of LigaSure is an automated vessel sealing device associated with minimal tissue bleeding and damage with reduced postoperative pain and a shorter duration required to return to normal activities.[4]

The study aims to compare the efficacy of LigaSure hemorrhoidectomy with conventional methods of haemorrhoidectomy.

MATERIAL & METHODS

After approval from Ethical Committee (DME/1050-20), A Quasi-experimental study was conducted in the Department of Surgery, Aziz Fatimah Hospital, Faisalabad, Pakistan 1st July 2020 -30th June 2021. The study comprised 60 patients of either gender with a mean age of 39. Patients with chronic liver disease, bleeding disorder, HIV positive, and unrestricted diabetes were excluded from the study. The study was single-blind, and patients were randomized into two groups using the lottery method. Both the operative procedures were conducted under Saddle block. Patients in both groups were admitted one day before the surgery and, after brief history, clinical examination and informed consent, were enrolled in the study. The patients were informed about all the possible outcomes of the surgery. The surgical procedure was carried out in lithotomy position and minor revere Trendelenberg angle. The primary surgery steps in both groups were the same and consisted of examination under anaesthesia.

Manual dilatation of the anus was done, and haemorrhoids were delivered. In Milligan Morgan's hemorrhoidectomy, the separation of hemorrhoidal tissue from the internal sphincter fibres by monopolar diathermy or scissors. The hemorrhoidal pedicle was transfixed with the aid of a Vicryl suture no.1. However, In Ligasure hemorrhoidectomy, all the dissection was done with the help of LigaSure, and the pedicle was coagulated. Packing of the anal canal was done in both groups. The pack was removed after 6 hours of surgery. Mean operative time and blood loss was calculated with the number of gauzes soaked with blood. A visual analogue pain scale was used to assess the postoperative pain score. A follow-up of 2 weeks was ensured for reporting any postoperative complication. The perioperative and postoperative variables were recorded, and statistical analysis was performed with SPSS software version 23. An Independent sample T-test was applied to compare the operative time, blood loss, and postoperative pain in both groups. Post-stratification Independent Sample T-test was applied; a P-value = 0.05 was significant and a P value <0.0001 was taken as highly significant.

RESULTS

A total of 60 patients were randomized into two groups containing 30 patients each. Table-I indicates the demographic profile of the patients enrolled in the study. Group A patients underwent LigaSure hemorrhoidectomy, and Group B patients underwent Conventional hemorrhoidectomy. The mean age calculated in both groups was 39 (group A) and 43 (group B).

Variables	Group A (LigaSure Hemorrhoidectomy)	Group B (Milligan Morgan Hemorrhoidectomy)
Mean Age	39 Years	43 Years
Gender		
Male	9 (30%)	6 (20%)
Female	21 (70%)	24 (80%)
Degree of Haemorrhoids		
3rd Degree	11 (37%)	09 (30%)
4th Degree	19 (63%)	21 (70%)

Table-I. Demographic profile of the patients

In the Ligasure group, the average time of surgery was 31.3 ± 5.76 minutes, whereas 51.7 ± 2.60 minutes in the other group, with a statistically significant difference (P < .0001). The mean blood loss in the Ligasure group was 31.3 ± 5.76 compared to 49 ± 7.11 ml for conventional hemorrhoidectomy. According to VAS of pain, the mean pain score on the first postoperative

day was 4 ± 1.29 compared to 6.3 ±1.53 for the conventional group. In both groups, the patients stayed in the hospital for 24 ± 4 hours postoperative. Only Two patients undergoing the conventional procedure were discharged late (3rd postoperative day) due to per rectal bleeding and acute urinary retention.

Variables	Group A (LigaSure Hemorrhoid-ectomy) Mean ± SD	Group B (Conventional Hemorrhoid-ectomy) Mean ± SD	P-Value
Average Operative Time(minutes)	38.4±2.77	51.7±2.60	<0.00001
Average blood loss(ml)	31.3±5.76	49±7.11	<0.00001
Pain score on first post-op day	4±1.29	6.3±1.53	<0.00001

Table-II. Perioperative and postoperative outcomes P value = < 0.0001 is considered highly significant.

DISCUSSION

In recent years, conventional methods have been implied to treat grade 4 and 3 haemorrhoids. The old conventional methods are associated with a high risk of complications. However, various new modalities have been explored in recent years to reduce the risk of per-operative and postoperative complications. One method uses LigaSure devices, which can coagulate a vessel up to a diameter of 7mm. Which significantly reduces the risk of per-operative and postoperative bleeding. The additional benefit of using LigaSure is less mean operative time, less blood loss and less pain score assessed by the visual analogue pain score.[5]

In our study, the mean blood loss recorded in patients undergoing LigaSure hemorrhoidectomy is 31.3 ± 5.76 ml, while in the other group, 49 ± 7.11 ml with a P value <0.00001. A comparative study by Aslam S suggests a reduced mean operative blood loss in patients undergoing LigaSure hemorrhoidectomy (5.39 ± 5.21) compared to those undergoing Milligan morgan hemorrhoidectomy (8.53 ± 3.78). The study reports a statistically significant score concluding that LigaSure hemorrhoidectomy has less blood loss than Milligan Morgan hemorrhoidectomy.[6] Another randomized control suggested less intraoperative bleeding in the patients with LigaSure, advocating the efficacy of the LigaSure procedure better in patients with coagulative disorders and anaemia.[7]

Our study reports significantly reduced operative procedure time in the case of a ligaSure hemorrhoidectomy. The mean operative time recorded in group A patient was 38.4 ± 2.77 minutes and 51.7 ± 2.60 in group B patients.The results of our study corroborate with the study by Raisan Mehdi shoramah aljabrey, which states a mean operative time of 12.2 ± 03 minutes and blood loss (4.1 ± 05) ml in patients undergoing LigaSure hemorrhoidectomy as compared to the patients undergoing conventional hemorrhoidectomy with an operative time of 23.3 ± 02 minutes and blood loss recorded as 6.2 ± 03 ml. The study reports statistically significant results with a P value of (p<0.001).[8] According to a study, the intraoperative and postoperative bleeding time was significantly reduced in patients who underwent LigaSure hemorrhoidectomy with a P-value <0.001 and 0.4164, respectively. The postoperative pain was also markedly reduced and statistically significant in such patients. The study reports a shorter mean operative time with a short duration of wound healing in patients with LigaSure hemorrhoidectomy.[9]

New techniques with specific advantages and disadvantages have been introduced in current years. The circular stapling device is the most remarkable new device for prolapsed haemorrhoids. Nevertheless, this device does not excise concerns regarding external components of haemorrhoids and skin tags. The bleeding during surgery was also less than the Milligan Morgan method because it effectively achieves hemostasis by complete coagulation of the vessel; that is why it is also called a 'vessel sealing system'. Traditional hemorrhoidectomy is related to notable pain-related complications. Additionally, suturing is required to prevent bleeding after surgery. Sometimes the operative field is unclear due to bleeding that results in prolonged surgery. We observed that Ligasure

haemorrhoidectomy is preferable to the traditional procedure in all these aspects. Hence, the Ligasure hemorrhoidectomy is relatively simple and can be carried out quickly. The submucosal dissection circumvents accidental anal sphincter injury. Compared with Milligan Morgan hemorrhoidectomy, LigaSure hemorrhoidectomy has less postoperative pain and the use of intravenous analgesics. It is because of very little thermal spread in surrounding tissue, reduced charring of tissue, and no use of sutures.[10]

CONCLUSION

Ligasure hemorrhoidectomy is a safer surgical procedure as it has less postoperative pain, shorter hospital stays, and rapid wound healing. Also, operative time is less than conventional hemorrhoidectomy, and less bleeding during the procedure.

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